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682,776



Date of filing Complete

Specification : April 24, 1950.

No. 24539/49.

Application Date : Sept. 23, 1949.

Complete Specification Published : Nov. 19, 1952.

Index at acceptance:—Classes 18, A4(b:d:f); 20(ii), F3b; and 44, E(13a:14a).

## COMPLETE SPECIFICATION.

### Improvements in or relating to Joints for Sheet Material.

SPECIFICATION NO. 682776

INVENTOR:— WILLIAM COOKSON

By a direction given under Section 17(1) of the Patents Act 1949 this application proceeded in the name of Cookson Sheet Metal Developments Limited, a British company, of 37-41, Gracechurch Street, London, E.C.1.

THE PATENT OFFICE,  
10th November, 1952

DB 39489/1(5)/3328 150 11/52 R

able for the rapid assembly, and dismantling, of such articles as air ducts, boxes, partitions, roofing, and furniture.

- 20 Another object of the invention is to provide sheet material joints which are water-proof, yet can expand and contract under temperature changes.

- A further object is to provide sheet panels 25 which may be metal, that can be enamelled or painted and then assembled, without causing damage to their surfaces.

- In accordance with the present invention I provide a joint between two relatively rigid 30 sheet material parts, comprising a male member and a female member, said male member having longitudinally spaced wedge-shaped projections parallel to the free edge of said member, the female member being 35 resilient and having a pair of spaced walls extending in the same general direction, said member being open along one side and closed at its opposite side whereat the walls are connected by a bulbous portion of larger 40 diameter than the distance between said walls, one of said walls having slots or holes therein inwardly of its free open side and longitudinally spaced apart at distances corresponding to the spacing of the projec- 45 tions on the male member, the projections and the slots on the respective members being

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relatively rigid sheet material, at least one of which is resilient, comprising a male member and a female member, said members having inter-engaging parts adapted to be 65 interlocked by forcing the members together in a direction substantially at a right angle to the runways, and an opening device slidably mounted on one of the members, said opening device having camming means for 70 engaging parts of the other runways to progressively unlock the inter-engaging parts and move the other runway laterally relatively to the runway upon which the opening device is mounted with the opening device is slid 75 along the joint in one direction.

Suitably I provide in combination, a joint between two relatively rigid sheet material parts, one of which is a male member having longitudinally spaced, wedge-shaped projec- 80 tions parallel to a free edge of said member, the other of which is a female member formed of resilient material having a pair of spaced walls extending in the same general direction, said walls being open at one side and 85 closed at their opposite sides, one of said walls having slots therein inwardly of its free edge and longitudinally spaced apart at distances corresponding to the spacing of the projections on the male member, the projec- 90 tions and the walls on the respective members being adapted to be interlocked by forcing

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## COMPLETE SPECIFICATION.

### Improvements in or relating to Joints for Sheet Material.

I, WILLIAM COOKSON, of 132, Portchester Road, Fareham, Hampshire, a British Subject, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to joints for sheet material.

10 This invention has for an object to obtain a tight joint suitable for a standing seam for a concealed joint between sheet material parts which are preferably machine-formed, which may be effected by clipping said parts together by hand pressure, in the factory or on site, without the use of tools, and is suitable for the rapid assembly, and dismantling, of such articles as air ducts, boxes, partitions, roofing, and furniture.

20 Another object of the invention is to provide sheet material joints which are waterproof, yet can expand and contract under temperature changes.

A further object is to provide sheet panels which may be metal, that can be enamelled or painted and then assembled, without causing damage to their surfaces.

In accordance with the present invention I provide a joint between two relatively rigid sheet material parts, comprising a male member and a female member, said male member having longitudinally spaced wedge-shaped projections parallel to the free edge of said member, the female member being resilient and having a pair of spaced walls extending in the same general direction, said member being open along one side and closed at its opposite side whereat the walls are connected by a bulbous portion of larger diameter than the distance between said walls, one of said walls having slots or holes therein inwardly of its free open side and longitudinally spaced apart at distances corresponding to the spacing of the projections on the male member, the projections and the slots on the respective members being

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adapted to be interlocked and disengaged by a selective longitudinal or transverse movement between said members, in the course of which movements the walls of the female member provided with the slots will give both transversely and longitudinally due to the resiliency of the material and the bulbous portion connecting said walls of the female member.

55 Preferably the wall of the female member which is formed with the slots has its free edge bent away from the other wall of said member.

I may also provide in combination, a joint between a pair of continuous runways of relatively rigid sheet material, at least one of which is resilient, comprising a male member and a female member, said members having inter-engaging parts adapted to be interlocked by forcing the members together in a direction substantially at a right angle to the runways, and an opening device slidably mounted on one of the members, said opening device having camming means for engaging parts of the other runways to progressively unlock the inter-engaging parts and move the other runway laterally relatively to the runway upon which the opening device is mounted with the opening device is slid along the joint in one direction.

Suitably I provide in combination, a joint between two relatively rigid sheet material parts, one of which is a male member having longitudinally spaced, wedge-shaped projections parallel to a free edge of said member, the other of which is a female member formed of resilient material having a pair of spaced walls extending in the same general direction, said walls being open at one side and closed at their opposite sides, one of said walls having slots therein inwardly of its free edge and longitudinally spaced apart at distances corresponding to the spacing of the projections on the male member, the projections and the walls on the respective members being adapted to be interlocked by forcing

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the members together in a direction substantially at right angles to their lengths, and an opening device slidably mounted on one of the members, said opening device having camming means for engaging parts on the other member to progressively unlock the interengaging projections from the slots and progressively move said other member laterally relatively to the member upon which the opening device is mounted when the opening device is slid along the interlocked members. If desired the closed side of the spaced walls of the female member is provided by a bulbous portion of larger diameter than the distance between said side walls.

If desired the opening device is slidably mounted on the female member and the male member has a longitudinal shoulder parallel to its free edge, against which shoulder the camming means on the opening device bears during its movement in unlocking the projections.

Preferably the projections are wedge-shaped with one vertical wall.

In order that the invention may be clearly understood and readily carried into effect, reference will be made to the drawings accompanying the provisional specification and to the accompanying drawings wherein the invention is illustrated by ways of example.

In the drawings accompanying the provisional specification:

Figs. 1a and 1b respectively show a cross-section view of the parts of a joint before assembly, comprising a springy jaw or bulbous-nosed member and an edge of one form of panel provided with projections or dimples.

Fig. 2 shows a fragmentary perspective view of a panel having a springy jaw member and a panel before they are inter-lockingly engaged.

Fig. 3 shows a cross-section view of the assembled joint after the parts have been forced into inter-locking engagement.

Fig. 4 shows a perspective view of a box assembly in which joints as illustrated in Figs. 1, 2 and 3 are employed.

Fig. 5 shows a fragmentary perspective view before assembly of another form comprising a curved springy jaw member, on one panel and the curved edge of a panel provided with projections or dimples.

In the accompanying drawings:—

Fig. 6 shows a fragmentary perspective view of a modified form of springy jaw member engaged with a panel.

Fig. 7 shows a fragmentary perspective view of the assembled joint in the released position.

Fig. 8 shows a fragmentary perspective exploded view of a further modification comprising a springy jaw member, a panel with a flanged edge, and a slide opener.

Fig. 9 shows a perspective view of a

springy member with a slide opener, being interlockingly engaged with the flanged panel; and

Fig. 10 shows a perspective view of an assembled springy jaw member with slide opener, and a flanged panel partly released.

In Figs. 1a and 1b, 2, 3, and 4, the springy female or jaw member A is made from sheet metal, plastics, or suitable material, and is open along one side and closed at its opposite side. It comprises a wall, which is folded back on itself at 2 to form a second wall 3, continuing in a bulbous portion or suitably curved attachment portion 4. The free end of portion 4 is bent at 5 to form a wall 6 which is spaced from but adjacent and substantially parallel to wall 3. The diameter of the bulbous portion 4 is of larger diameter than the distance between the walls 3, 6. In wall 6 at suitable intervals are slots or holes 7.

On the edge of a male member or panel B, formed of sheet metal, plastics, or suitable material, are formed wedge-shaped projections 8 preferably with vertical walls, spaced apart at intervals similarly to slots 7 in the springy jaw member A, and of such dimensions that they fit into and interlock with slots 7 when the jaw member A and the panel B are clipped together by a selective longitudinal or transverse movement between the male and female members, and disengage in a similar way. The female member A and the male member B may be said to constitute a pair of continuous runways.

As the type of sheet metal generally used for such work as cabinets and air ducting has little or no spring it is essential that the springy jaw member A be so constructed that wall 6 has sufficient resilience in the lateral direction to open and close without over-strain when being interlockingly engaged with panel B, and also to allow the projections on the panel edge progressively to lift said lip in the longitudinal direction locally at the position of each slot during the engaging movement, which latter is preferably made starting from one end of the joint. The walls of the female member give both transversely and longitudinally due to the resiliency of the material and the bulbous portion connecting the walls of the female member.

A box assembly is shown in Fig. 4, in which the sides of the box C have springy jaw members A formed on their vertical edges. Members A are also formed on the bottom edges. Ends D and D<sup>1</sup> have wedge-shaped projections or dimples formed in flanges 8 and 9. End D is shown prior to being snapped into interlocking engagement in the springy jaw members on the body, whilst end D<sup>1</sup> is shown after assembly.

In Fig. 5, E is a springy jaw member curved along its longitudinal axis, embodied

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ing slots 7a, F is the curved edge of a panel on which a flange 10 is formed. In flange 10 suitable wedge-shaped projections or dimples 8a are formed.

5 In Figs. 6 and 7 is shown a modified form of springy jaw member A, this member has a wall 11, which is continued with a bulbous resilient portion 12 to a wall 13 which is inclined to wall 11. Wall 13 is downwardly bent to form a curved shoulder 14 and upwardly bent at 15 away from the other wall of the member, to form a lip. The sharp front edges of slots 16 in shoulder 14 inter-engage with projections 17 of the panel edge 15 B. This edge has a step at 18.

In Fig. 7 springy jaw member A is shown after being slid along the panel edge B until projections 17 (shown dotted) are behind curved shoulder 14. In this position panel 20 edge B can be pulled laterally from the springy jaw member A, because the curved lower edge of shoulder 14 slips over projections 17.

In Figs. 8, 9 and 10 a further modification 25 of the invention is shown. In this form the springy jaw member A has a wall 19 connected by a bulbous portion 20 to a wall 21 which is inclined to wall 19, and has an upwardly turned lip 22.

30 The panel B is similar to B in Fig. 1b, but is upwardly bent at 23 to form a vertical wall 23' or shoulder.

The slide opener D has a curved edge 24 continuing in a wall 25. Wall 25 is downwardly and inwardly bent at 26 and has a rolled edge 27. At 28 is provided an extension piece which is wedge-shaped at each end.

In Fig. 9 slide opener D is shown positioned on the springy member A. The opener 40 is so dimensioned as to be an easy sliding fit, with rolled edge 27 located behind lip 22. The flanged panel B is shown being interlockingly engaged in the springy jaw member in a manner as previously explained. The 45 joint can be released by sliding the opener D longitudinally along the springy member A as in Fig. 10. The panels A and B form runways for the opener D.

As the slide opener D is slid along the 50 springy jaw member the rolled edge 27 lifts wall 21 sufficiently to allow each slot to disengage consecutively from each projection on the flanged panel B, while protuberance 28, forming camming means, bears against the 55 vertical wall 23' of the panel B to force the flange out of the springy member.

During the disengagement process, wall 21 of the springy jaw member has sufficient resilience in the longitudinal and lateral 60 directions to open without deformation.

The member and panel edge can thus be engaged and disengaged repeatedly without deterioration in the efficiency of the joint.

The slide opener may be used for curved 65 as well as straight forms.

In each form of the invention a waterproof joint may be obtained by inserting rubber or similar material in the bulbous attachment portion of the springy jaw member.

It will be apparent that many variations 70 can be made without departing from the scope and spirit of the invention.

What I claim is:—

1. A joint between two relatively rigid sheet material parts, comprising a male 75 member and a female member, said male member having longitudinally spaced wedge-shaped projections parallel to the free edge of said member, the female member being resilient and having a pair of spaced walls 80 extending in the same general direction, said member being open along one side and closed at its opposite side whereat the walls are connected by a bulbous portion of larger diameter than the distance between said 85 walls, one of said walls having slots or holes therein inwardly of its free open side and longitudinally spaced apart at distances corresponding to the spacing of the projec- 90 tions on the male member, the projections 90 and the slots on the respective members being adapted to be interlocked and disengaged by a selective longitudinal or transverse movement between said members, in the course of which movements the walls of the 95 female member provided with the slots will give both transversely and longitudinally due to the resiliency of the material and the bulbous portion connecting said walls of the female member.

2. A joint according to Claim 1 wherein 100 the wall of the female member which is formed with the slots has its free edge bent away from the other wall of said member.

3. In combination a joint between a pair 105 of continuous runways of relatively rigid sheet material, at least one of which is resilient, comprising a male member and a female member, said members having inter-engaging parts adapted to be interlocked by forcing 110 the members together in a direction substantially at a right angle to the runways, and an opening device slidably mounted on one of the members, said opening device 115 having camming means for engaging parts 115 of the other runways to progressively unlock the inter-engaging parts and move the other runway laterally relatively to the runway upon which the opening device is mounted when the opening device is slid along the 120 joint in one direction.

4. In combination, a joint between two relatively rigid sheet material parts, one of which is a male member having longitudinally spaced, wedge-shaped projections parallel 125 to a free edge of said member, the other of which is a female member formed of resilient material having a pair of spaced walls extending in the same general direction, said walls being open at one side and closed at 130

their opposite sides, one of said walls having slots therein inwardly of its free edge and longitudinally spaced apart at distances corresponding to the spacing of the projections 5 on the male member, the projections and the walls on the respective members being adapted to be interlocked by forcing the members together in a direction substantially at right angles to their lengths, and an opening device slidably mounted on one of the 10 members, said opening device having camming means for engaging parts on the other member to progressively unlock the inter-engaging projections from the slots and progressively move said other member laterally 15 relatively to the member upon which the opening device is mounted when the opening device is slid along the interlocked members.

5. The combination according to Claim 4, 20 wherein the closed side of the spaced walls of the female member is provided by a bulbous portion of larger diameter than the distance between said side walls.

6. The combination according to Claim 4, 25 wherein the opening device is slidably

mounted on the female member and the male member has a longitudinal shoulder parallel to its free edge, against which shoulder the camming means on the opening device bears during its movement in unlocking the projections. 30

7. A joint according to any of Claims 1 to 6 wherein the projections are wedge-shaped with at least one vertical wall.

8. Joint according to any of Claims 1 to 35 7 comprising springy jaw members curved along their longitudinal axes.

9. Joint according to any of Claims 1 to 8 comprising springy jaw members with rubber inserts to render the joint water-tight. 40

10. Joints for sheet material constructed and arranged substantially as herein described with reference to and as illustrated in the drawings accompanying the provisional specification and in the accompanying 45 drawings.

MEWBURN, ELLIS & CO.,

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Chartered Patent Agents.

#### PROVISIONAL SPECIFICATION.

#### Improvements in or relating to Joints for Sheet Material.

I, WILLIAM COOKSON, of 132, Portchester Road, Fareham, Hampshire, a British Subject, do hereby declare the nature of this invention to be as follows:—

50 This invention relates to joints for sheet material.

This invention has for an object to obtain a tight joint between sheet material parts 55 which are preferably machine-formed, which may be effected by clipping said parts together by hand pressure, in the factory or on site, without the use of tools, and is suitable for the rapid assembly of such articles as air 60 ducts, boxes, partitions, roofing and furniture.

Another object of the invention is to provide sheet material joints which are waterproof, yet can expand and contract under 65 temperature changes.

A further object is to provide sheet panels which may be of metal, that can be enamelled or painted and then assembled, without causing damage to their surfaces.

70 In accordance with the present invention I provide means for connecting sheet material, comprising a panel, substantially wedge-shaped projections or dimples being provided at intervals on or adjacent to an edge thereof, 75 said projections or dimples being interengageable with slots or holes similarly spaced on or adjacent to the edge of a member formed on the edge of another sheet, said member having a bulbous-ended nose and 80 being so dimensioned that, when the slots on the said member are snapped over the afore-

said wedge-shaped projections, the member is sufficiently springy in both the lateral and longitudinal directions to enable a tight joint to be formed. 85

In order that the invention may be clearly understood and readily carried into effect, reference will be made to the accompanying drawings, wherein the invention is illustrated by way of example, in which:— 90

Figs. 1a and 1b respectively show a cross-section view of the parts of a joint before assembly, comprising a springy bulbous-nosed member and an edge of one form of panel provided with projections or dimples. 95

Fig. 2 shows a fragmentary perspective view of a springy member and a panel before they are interlockingly engaged.

Fig. 3 shows a cross-section view of the assembled joint after the parts have been 100 forced into interlocking engagement.

Fig. 4 shows a perspective view of a box assembly in which joints as illustrated in Figs. 1, 2 and 3 are employed.

Fig. 5 shows a fragmentary perspective 105 view before assembly of another form comprising a curved springy bulbous-nosed member, and the curved edge of a panel provided with dimples or projections.

In Figs. 1a and 1b, 2, 3 and 4, the springy 110 member A is made from sheet metal, plastics, or suitable material. It comprises a wall 1, which is folded back on itself at 2 to form a second wall 3, continuing in a bulbous-ended nose 4. The free end of bend 4 is 115 bent at 5 to form a lip 6 which is adjacent

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and substantially parallel to wall 3. In lip 6 at suitable intervals are slots or holes 7.

On the edge of a panel B, formed of sheet metal, plastics, or suitable material, are 5 formed wedge-shaped protuberances or dimples with sloping ends, spaced at intervals similarly to slots 7 in the springy member, and are of such dimensions that they fit into slots 7 when the springy member A and the 10 panel B are assembled.

As the type of sheet metal generally used for such work as cabinets and air ducting has little or no spring it is essential that the spring member A be so constructed that lip 15 6 has sufficient resilience in the lateral direction to open and close without overstrain when being interlockingly engaged with panel B, and also to allow the protuberances on the panel edge progressively to lift said lip in 20 the longitudinal direction locally at the position of each slot during the engaging movement, which latter is preferably made starting from one end of the joint.

A box assembly is shown in Fig. 4, in 25 which the sides of the box C have springy members A formed on their vertical edges. Members A are also formed on the bottom edges. Ends D and D<sup>1</sup> have wedge-shaped

protuberances or dimples with sloping ends formed in flanges 8 and 9. End D is shown 30 prior to being forced into interlocking engagement in the springy members on the body, whilst end D<sup>1</sup> is shown after assembly.

In Fig. 5, E is a springy member curved along its longitudinal axis, embodying slots 35 7a, F is the curved edge of a panel on which a flange 10 is formed. In flange 10 suitable wedge-shaped protuberances or dimples 8a with sloping ends are formed.

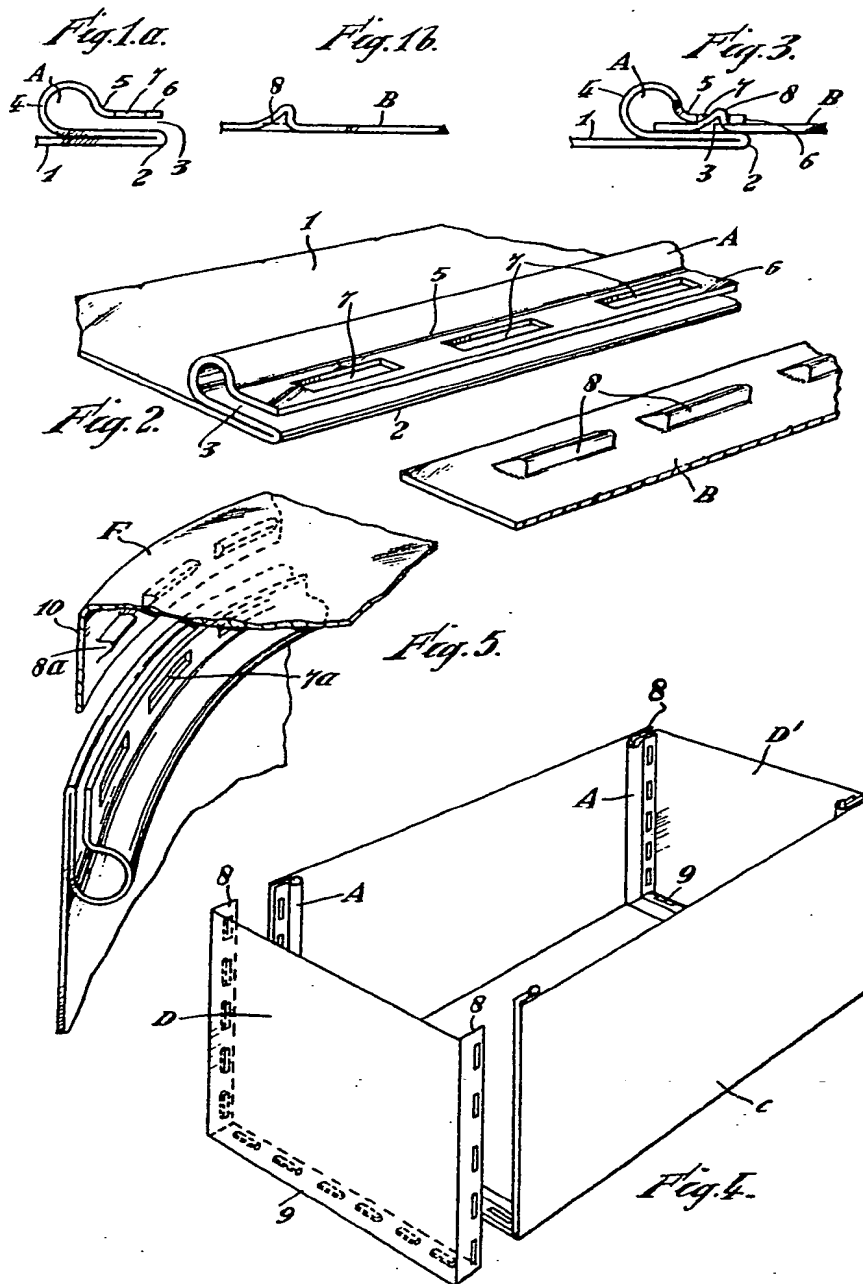
Another form of the invention relates to 30 roofing sheets in which a springy member is formed on one edge of an end longitudinal corrugation and projections formed on the opposite end corrugation. Lip 6, as in Fig. 1a, is preferably continued sufficiently long, 45 and curved to the contour of the corrugations, to enable the springy member to be nailed or similarly secured to purlin.

It will be apparent that many variations can be made without departing from the 50 scope and spirit of the invention.

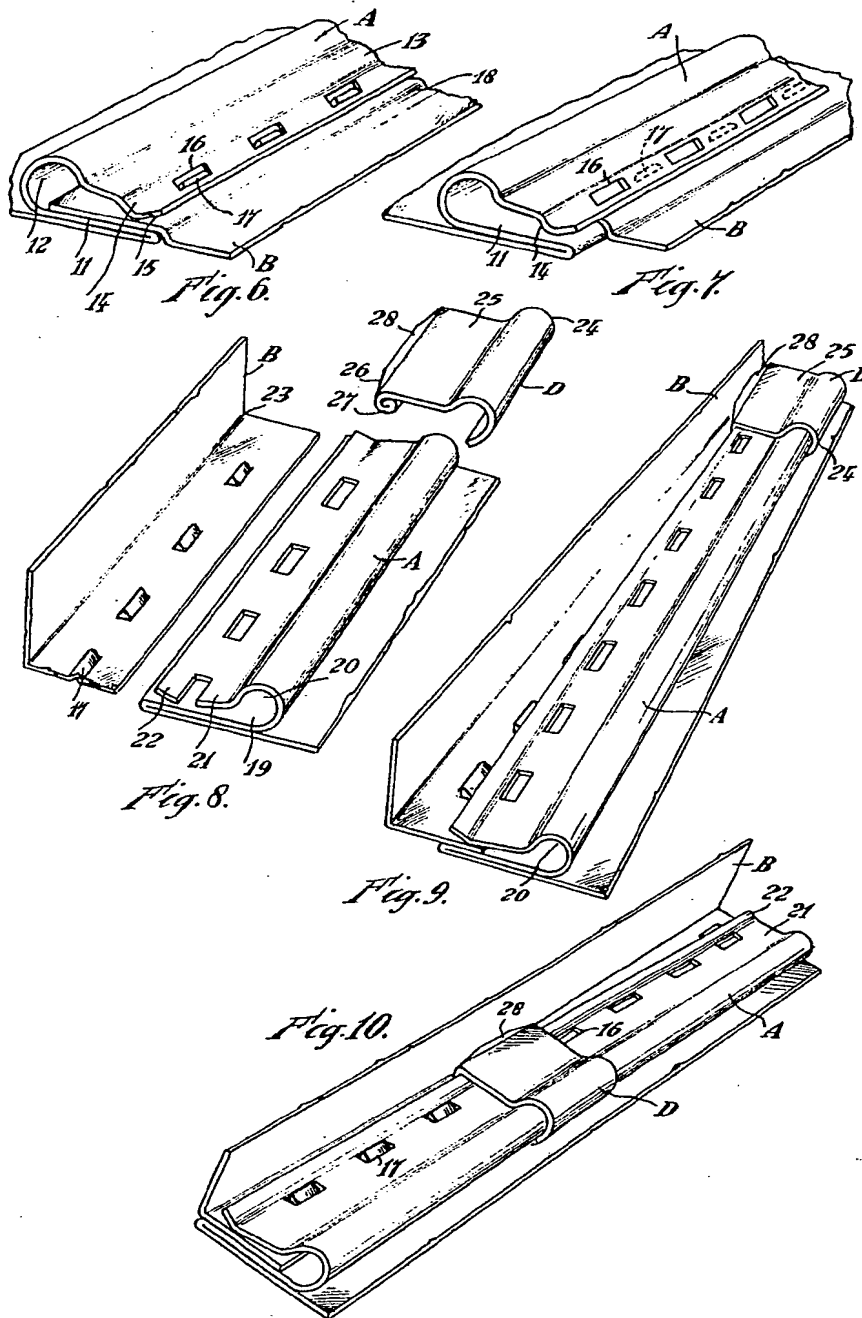
Dated this 23rd day of September, 1949.

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